

Claims

What is claimed is:

1. An engine valve actuation system, comprising:
an intake valve moveable between a first position that blocks a flow of fluid and a second position that allows a flow of fluid;
a cam assembly configured to move the intake valve between the first position and the second position; and
an electromagnetic actuator configured to selectively modify a timing of the intake valve in moving from the second position to the first position.
2. The engine valve actuation system of claim 1, wherein the electromagnetic actuator is a latching solenoid.
3. The engine valve actuation system of claim 2, wherein the electromagnetic actuator includes a solenoid coil and an armature coupled with a core, the armature and the core being movable together relative to the solenoid coil.
4. The engine valve actuation system of claim 3, further including a pivotable rocker arm operably coupling the cam assembly with the intake valve.
5. The engine valve actuation system of claim 4, wherein the core includes an end configured to selectively engage the rocker arm opposite to the intake valve.

6. The engine valve actuation system of claim 5, further including a controller configured to move the armature and the core between a first position and a second position.

7. The engine valve actuation system of claim 6, wherein the controller is configured to apply a first current to the solenoid coil to move the armature and the core from the first position to the second position to engage the rocker arm to modify the timing of the intake valve.

8. The engine valve actuation system of claim 7, wherein the electromagnetic actuator is configured such that the armature and the core remain at the first position when the controller removes the first current.

9. The engine valve actuation system of claim 7, wherein the controller is configured to apply a second current to the solenoid coil to move the armature and the core from the second position to the first position to disengage from the rocker arm, the second current being opposite to the first current.

10. The engine valve actuation system of claim 9, wherein the electromagnetic actuator is configured such that the armature and the core remain at the second position when the controller removes the second current.

11. The engine valve actuation system of claim 9, wherein the controller is configured to apply a third current to the solenoid coil to move the armature and the core from the first position to the second position to engage the rocker arm to slow a closing velocity of the intake valve.

12. A method of controlling an engine having a piston moveable through an intake stroke followed by a compression stroke, comprising:

moving an intake valve via a cam between a first position that blocks a flow of fluid and a second position that allows a flow of fluid during the intake stroke of the piston; and

actuating an electromagnetic solenoid associated with the intake valve when the intake valve is away from the first position to selectively modify a timing of the intake valve in moving from the second position to the first position.

13. The method of claim 12, wherein actuating includes controllably moving a coupled armature and core of the electromagnetic actuator between a first position and a second position.

14. The method of claim 13, wherein controllably moving includes applying a first current to a solenoid coil of the electromagnetic actuator to move the coupled armature and core from the first position to the second position to engage a rocker arm operably coupled with the intake valve to modify the timing of the intake valve.

15. The method of claim 14, wherein controllably moving includes applying a second current to the solenoid coil to move the coupled armature and core from the second position to the first position to disengage from the rocker arm, the second current being opposite to the first current.

16. The method of claim 15, further including applying a third current to the solenoid coil to move the coupled armature and core from the first position to the second position to engage the rocker arm to slow a closing velocity of the intake valve.

17. An engine, comprising:
a block defining at least one cylinder and a cylinder head having at least one intake passageway leading to the at least one cylinder;

at least one intake valve moveable between a first position to prevent a flow of fluid through the at least one intake passageway and a second position to allow a flow of fluid through the at least one intake passageway;

a cam assembly connected to the intake valve to move the intake valve between the first position and the second position; and

an electromagnetic actuator configured to selectively modify a timing of the intake valve in moving from the second position to the first position.

18. The engine of claim 17, wherein the electromagnetic actuator is a latching solenoid.

19. The engine of claim 18, wherein the electromagnetic actuator includes a solenoid coil and an armature coupled with a core, the armature and the core being movable together relative to the solenoid coil.

20. The engine of claim 19, further including a pivotable rocker arm operably coupling the cam assembly with the intake valve, wherein the core includes an end configured to selectively engage the rocker arm opposite to the intake valve.